

REMARKS

Entry of the foregoing, re-examination and reconsideration of the subject matter identified in caption, as amended, pursuant to and consistent with 37 C.F.R. §1.112, and in light of the remarks which follow, are respectfully requested.

Claims 1, 2, 5, 10, 13, 16 and 19 have been amended in response to issues raised in the Office Action. The feature of claim 18 has been added to claim 1 and claim 18 has been canceled. Claims 1-17 and 19-24 remain pending in this application. Claim 9 stands withdrawn from consideration on the merits.

Applicants acknowledge with appreciation the Examiner's indication on page 4 of the Office Action that claims 19 and 23 are drawn to patentable subject matter.

Claims 1-8, 18, 20, 21 and 24 were rejected under 35 U.S.C. §112, second paragraph, for the reasons set forth on pages 2-3 of the Office Action.

Reconsideration and withdrawal of this rejection are respectfully requested in view of the above amendments and for at least the reasons which follow.

The legal standard for determining compliance with the second paragraph of 35 U.S.C. §112 is whether the claims reasonably apprise those of ordinary skill in the art of their scope. See In re Warmerdam, 33 F.3d 1354,1361, 31 USPQ2d 1754,1759 (Fed. Cir. 1994). In determining whether this standard is met, the definiteness of the language employed in the claim must be analyzed, not in a vacuum, but always in light of the teachings of the prior art and of the particular application disclosure as it would be interpreted by one possessing the ordinary level of skill in the pertinent art. In re Johnson, 558 F.2d 1008,1015, 194 USPQ 187,193 (CCPA 1977).

In partial response to this rejection, the language of claim 18 has been added to claim 1. Thus, substituent R_1 is now defined as an alkylene or alkenylene group of 5-20 carbon atoms, substituent R_2 is now defined as hydrogen or an alkyl or alkenyl group of 2-20 carbon atoms, and substituent R_3 is now defined as a cyclic aliphatic group. Claims 2, 5, 10, 13 and 16 were amended to provide proper antecedent basis for the terminology added to claim 1.

Substituents R_4 and R_5 in formula (1) are derived from the polyhydroxy compounds employed in the second stage of the reaction which produces the polyester polyols of the invention. Suitable polyhydroxy compounds are listed on page 7, line 20 to page 8, line 1. These range from compounds such as ethylene glycol having 2 carbon atoms to compounds such as decamethylene glycol and dipentaerythritol having 10 carbon atoms. Obviously, this list is not exhaustive. Those of ordinary skill in this art would certainly be able to ascertain the scope of these claims based upon the many exemplary compounds disclosed.

Claims 1, 20, 21 and 24 were considered indefinite based on the use of the word "comprises." In response to this objection, claim 1 has been amended and now specifies polyester polyols of formula (1) and their mixtures. With respect to claims 20, 21 and 24, the use of "comprises" is intended to encompass mixtures of compounds as well as single compounds. This is fully supported by the disclosure. Applicants respectfully submit that those of ordinary skill in this art would understand the scope of the claims.

In view of the above amendments and remarks, the §112, second paragraph, rejection should be withdrawn. Such action is earnestly solicited.

Claims 1-8, 10-18 and 22 were rejected under 35 U.S.C. §102(b) as anticipated by JP 10-330470 to Kawai et al. for the reasons given on pages 3-4 of the Office Action. Reconsideration and withdrawal of this rejection are respectfully requested in view of the above amendments and for at least the following reasons.

JP '470 is directed to the preparation of polyurethane foams by reacting polyester polyols with polyisocyanates. The polyester polyols are prepared in a one-step condensation by simultaneously reacting a fatty acid or ester thereof such as castor oil, a dicarboxylic acid and a polyol. In contrast, Applicants' claimed polyester polyols are prepared in a two-step process in which a half-ester of a hydroxy-containing acid or ester and a cyclo-aliphatic dicarboxylic acid or anhydride is prepared initially and then reacted with a polyhydroxy compound in a subsequent step. Thus, the presently claimed polyester polyols are structurally different from the products of JP '470.

Moreover, JP '470 does not disclose cyclic aliphatic dicarboxylic acids or anhydrides, let alone the cyclic aliphatic 1,2-dicarboxylic anhydrides specified in claims 5, 13 and 20. The use of cyclic aliphatic dicarboxylic acids and anhydrides leads to light-fast polyurethanes.

Example A of JP '470 discloses a polyester polyol prepared from castor oil, terephthalic acid and ethylene glycol in a one-step dehydration process at 200-230°C for 3-4 hours. It is known that castor oil is dehydrated at temperatures higher than 200°C (c.f. page 3 of attached Savety Data sheet for castor oil form IMPAG AG; English translation)

"Further indications: pour point: about -24°C

dehydrates from: about 200°C"

Dehydrated castor oils do not have any hydroxyl groups left in their structure (c.f. attached Data sheet "dehydrated castor oils" from G.R. O'Shea). Kawai et al. explicitly states in example 1 that heating to dehydration at temperatures of 200-230°C. during 3 to 4 hours was undertaken. In the present invention, the secondary OH groups of the castor oil are used to bind the anhydride in the first step, i.e. half ester formation to yield in a subsequent reaction polyester polyol with primary OH groups. These primary OH groups have a much higher reactivity towards polyisocyanates as stated in the application (page 2, second paragraph). Clearly, the polyester polyols of Kawai is a totally different polymer.

Accordingly, for at least the aforementioned reasons, the §102(b) rejection based on JP '470 is inapplicable to the presently amended claims. In view thereof, the §102(b) rejection should be withdrawn.

From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order and such action is earnestly solicited. If there are any questions concerning this paper or the application in general, the Examiner is invited to telephone the undersigned at (703) 838-6683.

Respectfully submitted,

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Date: June 23, 2004

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Dehydrated Castor Oils

Castung® 403 U-V / 403 Z-3 polymerized (bodied) medium/high viscosity dehydrated castor oils are known for their faster processing and drying times than Castung® 103 G-H. these products also have non-yellowing and outstanding color retention characteristics. they are modifier resins that impart increased brushability and gloss in exterior coatings. Castung® 403 Z-3 is ideal as an aluminum paint vehicle because of its fast dry, flexibility and low acid value.

Characteristics

- Bodied dehydrated castor oil
- Low free acidity
- Triglyceride, very high linoleic acid content
- Absence of linoleic acid content
- Drying by conventional oil-based driers
- Fast drying and curing speed

Application

- Produce high quality, durable vehicles
- Light colored, non-yellowing films
- In "cooked" varnishes, they combine with all the basic resins, rosins, rosin-esters, hydrocarbons and phenolics producing clear varnishes and vehicles for pigmented coatings

Castung® 235 is a water dispersible dehydrated castor oil polymer developed to improve the adhesion of latex paints to chalky substrates, and as a VOC modifier for water-reducible alkyd coatings. As a VOC modifier for waterborne coatings it can be added at any point in the manufacturing process, or it can be post-added if desired.

Characteristics

- Fast drying
- Hydroxyl-containing oil polymer
- 100% active

Application

- Latex paints
- Latex stains

Copolymer 186 / Copolymer 186-85 are Castung® derivatives used in the preparation of quality varnishes and coating vehicles by cold-blending with selected resins at room temperature. Copolymer 186 has excellent compatibility with a wide range of resins at room temperature. It yields coatings with excellent exterior performance as clears, anticorrosive primers and coatings, aluminum paints and primers, blister resistant wood primers and for upgrading alkyd coatings. Copolymer 186-85 is a 15% solvent reduction of Copolymer 186.

Characteristics

- Produces vehicles with outstanding properties
- Improvement in total properties over conventional drying oils
- Not related to products obtained by copolymerizing a drying oil with styren, vinyl toluene, maleic anhydride or acrylic monomers

Application

- Superior clear exterior finishes
- Alkyd modification
- Performance directly related to the resin-type with which it is combined; pure phenolic and modified phenolic resins; rosin esters; hydrocarbon (petroleum and coal tar origin); chlorinated rubbers

XXX-1 Castor Oil is a partially dehydrated castor oil with mineral oil compatibility, it is USDA accepted as a trolley lubricant in meat packing houses. XXX-1 complies with 21CFR Part 178.3570 - Lubricants with Incidental Food Contact. It is an efficient plasticizer with excellent pigment wetting properties making it a choice product for caulks, sealants and joint compounds.

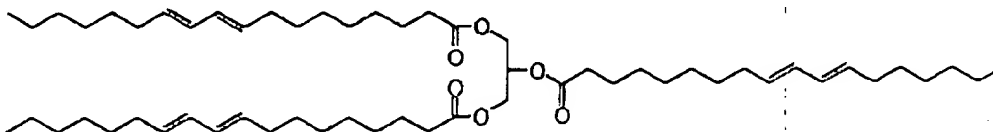
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Dehydrated Castor Oils

TYPICAL VALUES								
Product Name	Acid Value Maximum	Gardner Color Maximum	Viscosity (Stokes @ 25C)	Viscosity G-H	Saponification Value	Iodine Value	Specific Gravity	Pour Point, °F
Castung® 103 G-H	6	6	1.8	G	190	135	0.931	-50
Castung® 403 U-V	6	6	7.5	U	190	130	0.942	-35
Castung® 403 Z-3	6	6	46.0	Z2	190	123	0.949	-5
Castung® 235	6	5	24.0	Z	185	125	0.944	---
Copolymer 186	16	10	250.0	Z8	166	128	0.968	-1
Copolymer 186-85	15	10	27.0	Z2	142	110	0.937	---
XXX-1 Castor Oil	6	5+	2.8	L	187	120	0.942	-40

Non-drying castor oil is converted into a drying oil when the hydroxyl group and an adjacent hydrogen are removed from each ricinoleic acid chain. An additional double bond is created, resulting in two double bonds on each chain, of which 25% are in the conjugated position.



The result is a light colored, odorless, drying oil known as dehydrated castor oil. Dehydrated castor oil (DCO) is well known for its non-yellowing and outstanding color retention characteristics. Varnishes, alkyds and resin systems based on DCO are noted for fast-dry, flexibility, excellent chemical resistance, adhesion to metals, high gloss and water-resistance. The Castung® dehydrated castor oils are the most controllable conjugated oils for kettle reactions and are frequently used to modify other oils and fatty acid systems.

Castung® 103 G-H is an unbodied dehydrated castor oil that can be used with pure and modified phenolic resins to obtain fast-dry coatings, imparting alkali resistance for can linings, corrosion resistant coatings, traffic paints, ink vehicles and marine finishes. Castung® 103 G-H is an excellent plasticizer for petroleum hydrocarbon resins. Castung® 103 G-H is preferred for alkyd and copolymer resins. Pure dehydrated castor oil (unbodied) is well known for its non-yellowing and outstanding color retention characteristics. They are the most controllable conjugated oils and are frequently used to modify other oils and fatty acid systems.

Characteristics

- Unbodied dehydrated castor oil
- Low free acidity
- Triglyceride, very high linoleic acid content
- Absence of linoleic acid content
- Drying by conventional oil-based driers
- Fast drying and curing speed
- Differential reactivities

Application

- Produce high quality, durable vehicles
- Light colored, non-yellowing films
- Upgrade primary binder systems
- In "cooked" varnishes, they combine with all the basic resins, rosins, rosin-esters, hydrocarbons and phenolics producing clear varnishes and vehicles for pigmented coatings

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